REMARKS

Claims 7-9, 12-17, and 20-22 are active in the present application.

Although not explicitly stated, it appears that the Examiner has withdrawn the previous rejection over McQuillen et al. Accordingly, no specific comments are made herein with respect to the rejection over McQuillen et al. Applicants request acknowledgment that this ground of rejection has been withdrawn.

The rejections of Claims 7, 8, 10-11, and 23 under 35 U.S.C. §102(b) and under 35 U.S.C. §103(a) over Cutinelli et al are traversed.

The claimed *E. coli* strain claimed in Claims 7, 8, 10-11, and 23 is *not* the same as the Cutinelli et al *E. coli* for the reasons set forth hereinbelow.

The present invention provides, in part, an isolated *Escherichia coli,* which has an ability to produce and accumulate arginine in a medium when the bacterium is cultivated in the medium, and which is modified to have an enhanced ability to utilize acetate, whereby the ability to produce arginine is enhanced compared to the unmodified bacterium, wherein the bacterium is *Escherichia coli* strain 382 deposited as VKPM B-7926 and mutants thereof (see Claim 7).

The Examiner has now rejected the claims as being anticipated by Cutinelli et al. However, Cutinelli et al suffers from the same general deficiency as the disclosure of McQuillen et al (see August 29, 2003 response). Specifically, the present claims require that the strain be a *mutant* strain of *Escherichia coli*, which (a) has enhanced ability to utilize acetate, (b) has enhanced arginine production, and (c) wherein the bacterium is *Escherichia coli* strain 382 deposited as VKPM B-7926 and mutants thereof (Claim 7). Cutinelli et al

may disclose a strain of *Escherichia coli*; however, at no point do Cutinelli et al disclose or suggest any mutation to their disclosed strain or that the *Escherichia coli* is a mutant of any sort. Furthermore, there is absolutely no disclosure in Cutinelli et al that their strain has *enhanced* ability to utilize acetate as a carbon source.

Moreover, the focus of the disclosure of Cutinelli et al is amino acid metabolism when the *E. coli* is cultured using acetate as a carbon source. In contrast, the objective of the present invention is to enhance the production of amino acids (e.g., arginine). Accordingly, the objective of Cutinelli et al is distinct from the claimed invention. The objective of the claimed invention is achieved by *enhancing* the ability of the *E. coli* to utilize acetate. This enhancement is neither disclosed, nor suggested by Cutinelli et al.

The Examiner cites *In re Brown* and *In re Best* to support the premise that when a reference reasonably teaches a product that is identical or substantially identical or are produced by identical or substantially identical process, the PTO may require the Applicant to prove that the prior art products do not inherently possess the characteristics of the claimed product. In so doing, the Examiner states that the burden is shifted to the Applicant to prove that the reference product is not within the scope of the claimed invention. However, Applicants note that the Examiner has not even remotely met the burden necessary to shift the burden to the Applicant. Certainly the Examiner must provide a better basis to support the conclusion that the bacterium of Cutinelli et al is identical or substantially identical to the claimed bacterium. Applicants can find no support in the MPEP or in case law that supports the notion that a mere conclusory statement by an Examiner without any support to justify that conclusion would support the "reasonably teaches" threshold. In fact, this position by the Examiner is in direct odds with case precedent.

The Examiner's attention is again drawn to *Ex parte* Jones, 62 USPQ2d 1206, 1208 (Bd. Pat. App. & Inter. 2001), which states that: when an Examiner maintains that there is an implicit teaching or suggestion in the prior art, "the Examiner should indicate where (page and line or figure) such a teaching or suggestion appears in the prior art." The Board has also stated that the burden of proving inherency lies on the Examiner, stating: "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." (*Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)).

In the present case, the Examiner simply points out the fact that the *E. coli* of Cutinelli et al grows in medium containing acetate; however, there is no indication that this strain has an *enhanced* the ability of the *E. coli* to utilize acetate much less produce an appreciable quantity of arginine. Furthermore, the claimed invention is now limited to *Escherichia coli* strain 382 deposited as VKPM B-7926 and mutants thereof. *Escherichia coli* strain 382 deposited as VKPM B-7926 is defined on page 8, line to page 9, line 16, and is resistant to the pyrimidine analog 6-azaurail, which was induced by using 1-methyl-3-nitro-1-nitrosoguanidin (NTG) to give rise to strain 237, which was then NTG treated and screened for maximum arginine production. Once again, this mutation and, thus, the mutant strain is not disclosed or suggested by Cutinelli et al.

Accordingly, Applicants submit that the Examiner has not successfully shifted the burden to the Applicant to prove that the strain of Cutinelli et al does not fall within the scope of the present claims.

Even if the Examiner had met his burden, Applicants submit that the clear distinction between the inventive bacterium and that disclosed by Cutinelli et al as highlighted above

would clearly distinguish the present invention from this disclosure. In view of the same it is clear that Cutinelli et al fails to anticipate the claimed invention.

Furthermore, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation... to modify the reference... Second, there must be a reasonable expectation of success. Finally, the prior art reference... must teach or suggest all the claim limitations." (MPEP §2142) Applicants note that the Cutinelli et al fail to provide the requisite suggestion to modify the reference to arrive at the claimed strain of *E. coli*, much less suggest all the claim limitations and, therefore, the present invention would not be obvious in view of the references.

Therefore, for all the foregoing reasons, Applicants submit that the present invention is not anticipated by or obvious in view of Cutinelli et al.

Withdrawal of these grounds of rejection is requested.

The rejection of Claims 7-8, 10-11, and 23 and the specification under 35 U.S.C. §112, first paragraph (written description), is traversed.

At the outset, Applicants note that Claim 7 has been amended to limit the scope to *Escherichia coli* strain 382 deposited as VKPM B-7926 and mutants thereof. The deposit receipts for the deposited strains FERM BP-7925 (parent strain to *Escherichia coli* strain 382, see Example 1) and FERM BP-7926 were filed on June 22, 2001. These strains are specifically identified on page 8, lines 14-19 and page 9, lines 11-16. As noted on those pages, those strands have been deposited under the terms of the Budapest Treaty. Moreover, on July 18, 2002, Applicants averred that "all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of a patent."

Applicants note that the U.S. Courts have long held that availability of a biological product via a public depository (such as in the present case) provides an acceptable means of meeting the written description and the enablement requirements of 35 U.S.C. §112, first paragraph (see *In re Argoudelis*, 434 F.2d 1390, 1392, 168 USPQ 99, 102 (CCPA 1970)). The Examiner acknowledges full agreement with the courts in *In re Argoudelis*; however, attempts to distinguish the present application from *In re Argoudelis* stating that in *In re Argoudelis*, "A detailed taxonomic description of the microorganism was also disclosed.' However, this assertion underscores the Examiner's lack of understanding of the field to which the invention pertains.

The Examiner is reminded that following sources may be noted for the definition of "taxonomy" which is:

a) 1) The study of the general principles of scientific classification; 2) orderly classification of plants and animals according to their presumed natural relationship (Merriam Webster's Collegiate Dictionary, 10th Edition, 1994)

b) The classification (arrangement), nomenclature (naming), and identification of organisms (Microbiology: Concepts and Applications; Pelczar MJ, et al, 1993)

c) The classification of various living things or organisms, divided into groups to show degrees of similarity or presumed evolutionary relationship (Webster's New World/Stedman's Concise Medical Dictionary, 1987)

Therefore, the claims (and the specification) do, *in fact*, provide a taxonomic description: genus – *Escherichia*, species – *coli*. Moreover, the skilled artisan would immediately envision the morphological characteristics for identifying *E. coli*, as morphological characteristics is one of the central tenants of taxonomic classification. This is most certainly the case for the specific strain of Claim 7, which is explicitly genotypically defined on page 8, lines 6 to page 9, line 16 of the specification.

Despite case precedent and scientific convention, the Examiner has still required the addition of the identifying information set forth in 37 C.F.R. §1.809(d) to the specification. 37 C.F.R. §1.809(d) requires inclusion of the following information:

(1) The accession number for the deposit;
(2) The date of the deposit;
(3) A description of the deposited biological material sufficient to specifically identify it and to permit examination; and
(4) The name and address of the depository.

However, this information is already in the specification. Specifically, Applicants point to page 5, 11-18, which provides the depository, date of deposit, and the accession number. In addition, Applicants point to Example 1 (page 8, line 4 to page 9, line 16), which fully describes characteristics of the deposited mutant *E. coli* cell strains. In particular, these strains have an ability to produce and accumulate arginine in a medium when the bacterium is cultivated in the medium, and which is modified to have an enhanced ability to utilize acetate, whereby the ability to produce arginine is enhanced compared to the unmodified bacterium. Moreover, this information has been added to Claim 7. Therefore, Applicants submit that the present claims are drawn to a deposited material, as such the Examiner would be able to compare the presently claimed invention to any prior art. In fact, the Examiner has already compared the present invention to the prior art (i.e., McQuillen et al and Cutinelli et al).

The Examiner also continues to cite *In re Hammack*, *In re Venezia*, *In re Goffe*, *In re Watson*, *In re Knowlton*, *In re Steele*, *In re Moore*, and *In re Merat*. However, for the reasons of record and self-evident from these cases, their citation is irrelevant to the analysis of sufficient written description in the present case, which is controlled by the precedent of *In re Argoudelis*. These other cases do not pertain to biotechnology and the special problems in this art relating to 35 U.S.C. §112, first paragraph. Therefore, the proper precedent for establishing the adequacy of the claimed microorganism under 35 U.S.C. §112, first

paragraph, is that of *In re Argoudelis* and not those enunciated by *In re Hammack*, *In re Venezia*, *In re Goffe*, *In re Watson*, *In re Knowlton*, *In re Steele*, *In re Moore*, and *In re Merat*. The Examiner has already conceded the holding of *In re Argoudelis* that availability of a biological product via a public depository provides an acceptable means of meeting the written description and the enablement requirements of 35 U.S.C. §112, first paragraph. Therefore, Applicants submit that the deposit of the claimed microorganisms satisfies the *In re Argoudelis* standard for examining biotechnology applications.

Accordingly, Applicants submit that these grounds of rejection by the Examiner are not tenable and request that they be withdrawn.

With respect to the non-elected claims drawn to methods of producing arginine (Group III, see Claims 15-22), Applicants request that upon finding that the elected group is found to be allowable (Claims 7-14), the corresponding non-elected process claims should be rejoined in accordance with MPEP §821.04.

Applicants submit that the present application is now in condition for allowance.

Early notification of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Stephen G. Baxter
Registration No. 32,884

Vincent K. Shier, Ph.D.
Registration No. 50,552

Customer Number
22850
(703) 413-3000
Fax #: (703)413-2220
NFO/VKS